

REMARKS/ARGUMENTS

Claims 7, 8, 11-32 and 58-65 are pending herein. Claim 7 has been amended and new claim 65 has been added as supported by page 15, lines 8-18 and page 16, lines 1-14 of the specification, for example. Applicants respectfully submit that no new matter has been added.

1. Claims 7, 8, 11, 14, 16-19, 21, 22, 26-32, 59 and 64 were rejected under §103(a) over Brennan in view of Sluka. To the extent that this rejection may be applied against the amended claims, it is respectfully traversed.

Claim 7 recites a method for producing a biochip comprising the steps of providing a base plate and supplying, onto the upper surface of the base plate, a plurality of solution samples, each containing a capture. The method further comprises the step of supplying a solution containing no capture in accordance with an ink-jet system separately from and in the same location as each of the solution samples. Claim 7 has been amended to clarify that one of the solution sample and the solution containing no capture is supplied onto the other one of the solution sample and the solution containing no capture while the other one of the solution sample and the solution containing no capture is in liquid form.

The Examiner is respectfully requested to note that the combination of Brennan and Sluka fail to disclose or suggest the method recited in claim 7 for at least the following reasons. First, Sluka fails to disclose or suggest that the first solution supplied to the base plate (solution sample or solution containing no capture) is in liquid form **while** the second solution is supplied. In fact, Brennan discloses, in column 6, lines 51-52 and Fig. 3(c), that only a hydroxyalkylsiloxane surface (alleged first solution supplied) is wet by an acetonitrile (alleged second solution supplied) such that the two components do not mix as they would if the hydroxyalkylsiloxane surface were in liquid form at the time the acetonitrile is applied. Similarly, Sluka fails to disclose or suggest that the reaction partners (alleged first solution supplied),

which could theoretically be applied using an ink jet device, is in liquid form at the time a second solution is supplied. Therefore, the combination of Brennan and Sluka fail to disclose or suggest a method for producing a biochip wherein one of the solution sample and the solution containing no capture is supplied onto the other one of the solution sample and the solution containing no capture while the other one of the solution sample and the solution containing no capture is in liquid form, as recited in claim 7.

It is also significant that Brennan and Sluka fail to acknowledge the problem solved by the novel method recited in claim 7. For example, Sluka discloses, in column 10, lines 36-40, that, if the zones or spots of the compartmented binding matrix are intended to be the same, the base plate can simply be immersed in a reaction solution which contains the molecules necessary for producing the desired binding matrix. In other words, in situations where the solution containing no capture is common to all the solution samples, Sluka discloses that an immersion method should be used. To the contrary, Sluka discloses in column 10, lines 40-51, that ink-jet printing is only used, for example, for a situation where the binding matrices of the individual zones are intended to be different or where different degrees of dilution of the binding matrices on the various spots are produced by a different proportion of diluent molecules being present in the individual reaction solutions that are applied to different spots.

The inventors of the present application have found that the conventional immersion method results in undesirable and unresolved satellite formation problems. Similarly, the inventors have found that conventional ink-jet printing also results in undesirable and unresolved satellite formation problems. The Examiner is respectfully requested to note that these findings are significant to the differences between the disclosed methods in Brennan and Sluka and the method recited in claim 7 of the present application. Without explicitly acknowledging the undesirable aspects of the unintended formation of satellites in the deposition of the solutions, a person skilled in

the art would clearly use the general immersion method when the solution containing no capture is common to all the solution samples because the ink-jet printing method is extremely complicated.

Contrary to the disclosure of Sluka and as would have been understood to one skilled in the art, the present invention is based on the knowledge that it is possible to avoid the undesirable satellite formation by spotting a solution containing a capture and a solution containing no capture in the same location, to which the solutions are to be applied, by the ink-jet printing method. It is highly unlikely that satellite droplets are formed by the solution containing a capture and the solution containing no capture at exactly the same point. In other words, individual satellite droplets formed by the solution containing no capture will be located at a different location from satellite droplets formed by the solution containing capture. Accordingly, even though the ink-jet printing and the general immersion method still have the satellite formation problem when it is used in the conventional manner, the problem of forming satellite droplets can be solved by following the method recited in claim 7 (see specification page 22, line 4--page 23, line 12 of the specification). Along these lines, both Brennan and Sluka fail to disclose or suggest that satellite formation is a problem and that one way to overcome the problem is through the method where one of the solution sample and the solution containing no capture is supplied onto the other one of the solution sample and the solution containing no capture while the other one of the solution sample and the solution containing no capture is in liquid form, as recited in claim 7.

Furthermore, the method recited in the present application utilizes the ink-jet printing method even if the solution containing no capture is common to all of the solution samples for the following reasons. With a common solution containing no capture, it is easy to achieve a desired constant discharge condition of the ink-jet device such that only one type of discharge unit and only one type of waveform of the voltage applied to a piezoelectric/electrostrictive element in the ink-jet device is used.

As a result, the Examiner is respectfully requested to note that it is possible to stably form spots at the correct locations (see specification, page 22, lines 4-17). Because both Brennan and Sluka fail to disclose or suggest that satellite formation is of a concern in the deposition of the solution containing no capture, the timing relating to the deposition of the solution sample and the solution containing no capture (i.e., the first applied solution remains in liquid form at the time the second solution is applied) would not have been a result effective variable since the problem to be solved was not understood to be present in the methods disclosed in Brennan and Sluka.

For at least the foregoing reasons, Applicants respectfully submit that the method for producing a biochip recited in claim 7, would not have been obvious to one skilled in the art provided with the disclosures of Brennan and Sluka. Since claims 8, 11, 14, 16-19, 21, 22, 26-32, 59 and 64 depend either directly or indirectly from claim 7, those claims are also believed to be allowable over the applied prior art. Accordingly, reconsideration and withdrawal of the present rejection are respectfully requested.

2. Claims 23 and 25 were rejected under §103(a) over Brennan [sic, and Sluka] in view of Okamoto. Applicants respectfully submit that the arguments submitted above distinguish claim 7 from Brennan. Since Okamoto does not overcome the deficiencies of Brennan and Sluka, and since claims 23 and 25 depend indirectly from claim 7, those claims are also believed to be allowable over the applied prior art.

3. Claims 12, 13 and 15 were rejected under §103(a) over Brennan [sic, and Sluka] in view of Borrelli. Applicants respectfully submit that the arguments submitted above distinguish claim 7 from Brennan. Since Borrelli does not overcome the deficiencies of Brennan and Sluka, and since claims 12, 13 and 15 depend indirectly from claim 7, those claims are also believed to be allowable over the applied prior art.

4. Claim 20 was rejected under §103(a) over Brennan [sic, and Sluka] in view of Hammond. Applicants respectfully submit that the arguments submitted above distinguish claim 7 from Brennan. Since Hammond does not overcome the deficiencies of Brennan and Sluka, and since claim 20 depends indirectly from claim 7, claim 20 is also believed to be allowable over the applied prior art.

5. Claim 24 was rejected under §103(a) over Brennan [sic, and Sluka] in view of Dattagupta. Applicants respectfully submit that the arguments submitted above distinguish claim 7 from Brennan. Since Dattagupta does not overcome the deficiencies of Brennan and Sluka, and since claim 24 depends indirectly from claim 7, claim 24 is also believed to be allowable over the applied prior art.

6. Claim 58 was rejected under §103(a) over Brennan [sic, and Sluka] in view of Balint, Jr. Applicants respectfully submit that the arguments submitted above distinguish claim 7 from Brennan. Since Balint, Jr. does not overcome the deficiencies of Brennan and Sluka, and since claim 58 depends indirectly from claim 7, claim 58 is also believed to be allowable over the applied prior art.

7. Claim 60 was rejected under §103(a) over Brennan [sic, and Sluka] in view of Sakamoto. Applicants respectfully submit that the arguments submitted above distinguish claim 7 from Brennan. Since Sakamoto does not overcome the deficiencies of Brennan and Sluka, and since claim 60 depends indirectly from claim 7, claim 60 is also believed to be allowable over the applied prior art.

8. Claim 61 was rejected under §103(a) over Brennan [sic, and Sluka] in view of Schwartz. Applicants respectfully submit that the arguments submitted above distinguish claim 7 from Brennan. Since Schwartz does not overcome the deficiencies of Brennan and Sluka, and since claim 61 depends indirectly from claim 7, claim 61 is also believed to be allowable over the applied prior art.

9. Claim 62 was rejected under §103(a) over Brennan [sic, and Sluka] in view of Wei. Applicants respectfully submit that the arguments submitted above distinguish claim 7 from Brennan. Since Wei does not overcome the deficiencies of Brennan and Sluka, and since claim 62 depends indirectly from claim 7, claim 62 is also believed to be allowable over the applied prior art.

10. Claim 63 was rejected under §103(a) over Brennan [sic, and Sluka] in view of Lopez. Applicants respectfully submit that the arguments submitted above distinguish claim 7 from Brennan. Since Lopez does not overcome the deficiencies of Brennan and Sluka, and since claim 63 depends indirectly from claim 7, claim 63 is also believed to be allowable over the applied prior art.

11. With regard to new claim 65, the Examiner is respectfully requested to note that when the other solution is a solution containing no capture, it is possible to avoid the time-dependent change of the immobilization solution and to effectively reinforce the immobilization of the capture, unlike a situation where the immobilization solution is previously supplied onto the base plate (see specification, page 14, lines 8-16). Because the solution containing no capture is in liquid form at the time the solution sample is applied, the solution containing the capture solution is diffused up to a supply area formed by a sample containing no capture solution (see specification, page 22, line 18--page 23, line 1). To the contrary, in the ordinary method for producing biochips as in the prior art (i.e., Brennan and Sluka), the solution containing no capture is applied at a time well before the solution samples are applied such that the solution containing no capture are subjected to the newly found detriments such as allowing the solution containing capture to dry or solidify before the application of the solution sample (see specification, page 23, lines 2-12).

For at least the foregoing reasons, Applicants respectfully submit that all pending claims herein define patentable subject matter over the art of record.

Accordingly, the Examiner is requested to issue a Notice of Allowance for this application in due course.

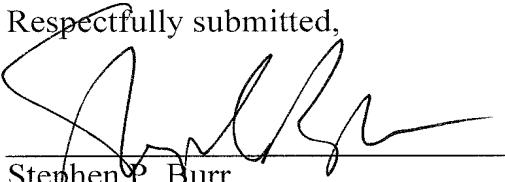
If the Examiner believes that contact with Applicants' attorney would be advantageous toward the disposition of this case, the Examiner is herein requested to call Applicants' attorney at the phone number noted below.

The Commissioner is hereby authorized to charge any additional fees associated with this communication or credit any overpayment to Deposit Account No. 50-1446.

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Date

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